REMARKS

INTRODUCTION

In accordance with the foregoing, claims 8 and 10 have been amended. No new matter is submitted and reconsideration of the allowability of the pending claims is respectfully requested.

Claim 8 has been indicated as including allowable subject matter, and claims 1-7 and 9-14 stand rejected. Claim 10 has not been amended for patentability reasons, but to correspond more to independent claim 1. In addition, applicants similarly do not relinquish any subject matter between the previous claim and the pending amended claim 10.

Claims 1-14 are pending and under consideration.

CLAIM OBJECTION

Claim 8 stands objected to for including a typographical error. As claim 8 has been amended to correct this error, it is respectfully requested this objection be withdrawn.

CLAIM REJECTION UNDER 35 USC 102

Claims 1, 3, 4 and 10-14 stand rejected under 35 USC 102(e) as being anticipated by Adachi et al., U.S. Patent No. 6,640,063, This rejection is respectfully traversed.

By way of review and solely as an example, independent claim 1 sets forth:

"[a] charging voltage controller of an image forming apparatus comprising:

a charging roller charging a photoconductive drum with a predetermined charging voltage;

a high voltage supply unit supplying the predetermined charging voltage to the charging roller;

an electric current detecting unit detecting an electrical current flowing to the charging roller; and

a control unit supplying first and second test voltages of different levels to the charging roller, determining a first reference voltage to be applied to the charging roller based on data from the electric current detecting unit outputted in response to the first test voltage, calculating slope data based on the electrical current data detected from the electric current detecting unit in response to the first and second test voltages, and determining the charging voltage to be applied to the charging roller as a sum of the first reference voltage and a preset offset voltage

that corresponds to the slope data."

Thus, independent claim requires two different test voltages to be applied. Upon application of the first test voltage an electric current flowing through the charging roller is detected. A first reference voltage is then calculated based on the detected electric current.

A second test voltage is applied, and slope data of detected currents flowing through the charging roller is calculated based on the applied first and second test voltages. From this calculated slope data an applicable preset offset voltage can be determined from the calculated slope data.

The claimed charging voltage is then based on the addition of the first reference voltage and the preset offset voltage.

It is respectfully submitted that the above corresponds to a particular methodology for determining a preferred charging voltage. Additionally, it is further respectfully submitted that the particular methodology implemented in Adachi et al. is not the same. The two methodologies are different. The resultant charging voltages are derived through different calculations and are based on different data.

In particular, FIG. 6 of Adachi et al. illustrates the charging voltage calculation method of Adachi et al. First, in Adachi et al., the control circuit executing a program of calculating and determining an appropriate peak-to-peak voltage bases that calculation on a current measuring unit 14 and an environment sensor 15. The environment sensor includes a thermometer and hygrometer for detecting the temperature and humidity. Thus, at a basic level, Adachi et al. bases an appropriate peak-to-peak voltage on detected current values and separate measured environmental conditions. See Adachi et al. in col. 10, lines 40-52.

A more detailed explanation of how to calculate an appropriate charging voltage is primarily discussed in Adachi et al., beginning in col. 11, line 61, through col. 12, line 53. Therein, FIG. 6 is also explained.

As illustrated in FIG. 6, multiple voltages are applied to the charging roller; three peak-to-peak voltages are applied "at three points within the discharge area and three peak-to-peak voltages at three points within the undischarge area." Adachi et al., col. 12, lines 4-10.

At each peak-to-peak voltage application a corresponding current is measured at the photosensitive member. From these measured current values two different lines can be approximated, and from these two different lines two slopes can be calculated. Similarly, for

each approximated line corresponding line constants A and B are respectively calculated. See equations 2 and 3 in col. 12 of Adachi et al.

Then a "difference between the approximate line for the discharge area of Eq. 2 and the approximate line for the undischarge area of Eq. 3 becomes the predetermined discharge current amount D." Adachi et al. in col. 12, lines 29-34.

Finally, using equation 4 of Adachi et al., the calculated line constants A and B, the discharge current amount D, and the two calculated line slopes are input to the equation and the resultant appropriate peak-to-peak voltage to be applied to the charging roller is calculated.

Thus, Adachi et al. sets forth a particular method of calculating an appropriate peak-to-peak voltage based on generating two different lines over discharge and undischarge areas and using a comparison between the two lines to define the resultant appropriate peak-to-peak voltage.

The Adachi et al. method is not the same as the claimed application of two different test voltages, using the first test voltage to calculate a reference voltage, and using the slope of the measured current line generated by the two test voltages to calculate an offset voltage, and them summing the reference voltage and offset voltages to get an appropriate charging roller voltage.

It is respectfully submitted that the two methods are fundamentally different.

As further evidence of the differences, it was noted above that Adachi et al. utilizes data from environmental sensors in cooperation with the aforementioned calculating operation of FIG. 6. Adachi et al. in col. 10, lines 40-52.

Conversely, embodiments of the present invention utilize the measured current from the first test voltage to apply an environmental table to find the reference voltage.

Thus, in embodiments of the present invention, the inventive method described above in claim 1 would be operable to utilize environmental information directly from the measured current from the first test voltage. Conversely, the method of Adachi et al. would not appear to consider such environmental information in the above referenced equations. Thus, though independent claim 1 is not limited to use an environmental table, the fact that such an application is possible is further evidence of the differences between the method of Adachi et al. and that of the presently claimed invention.

Accordingly, it is respectfully submitted that Adachi et al. fails to disclose all the claimed

features of independent claims 1 and 10.

Therefore, for at least the above, it is respectfully requested that this rejection of claims 1, 3, 4 and 10-14 be withdrawn and claims 1, 3, 4 and 10-14 be allowed. In addition, for at least the above, it is respectfully submitted that claims depending from independent claims 1 and 10 are equally allowable.

CLAIM REJECTION UNDER 35 USC 103

Claims 2, 5, 6 and 9 stand rejected under 35 USC 103 as being obvious over Adachi et al., in view of Saito et al., U.S. Patent No. 6,615,002. This rejection is respectfully traversed.

For at least the above, it is respectfully submitted that Saito et al. similarly fails to disclose the presently claimed apparatus and method for applying an appropriate charging voltage. In addition, it is respectfully submitted that as a whole, neither reference discloses or suggests motivation for further modifying either Adachi et al. or Saito et al., or a combination of the two, to disclose the same.

Further, the Office Action has pointed to Saito et al. as supporting an obviousness rationale of further modifying Adachi et al. to include the claimed look up tables, based on Saito et al.'s use of storage and potentially a table. However, Saito et al. fails to disclose the particular claimed lookup table, nor provide any suggestion that Adachi et al. should be modified to include the same. Arguably, Saito et al. can only support a motivation of having storage or memory. However, there must still be particular motivation for the particularly claimed look up tables. As noted above, Adachi et al. wouldn't even need a table with environmental information, as Adachi et al. doesn't base the primary calculations on that information and, rather, uses environmental sensors to provide that information.

Therefore, for at least the above, it is respectfully requested that this rejection of claims 2, 5, 6 and 9 be withdrawn and claims 2, 5, 6 and 9 be allowed.

Claim 7 stands rejected under 35 USC 103 as being obvious over Adachi et al., in view of Nakaya, U.S. Patent No. 5,132,869. This rejection is respectfully traversed.

For at least the above, it is respectfully submitted that Nakaya similarly fails to disclose the presently claimed apparatus and method for applying an appropriate charging voltage. In addition, it is respectfully submitted that as a whole, none of the cited references disclose or suggest motivation for further modifying either Adachi et al., Nakaya, or Saito et al., or a combination of the same, to disclose the presently claimed invention.

Therefore, for at least the above, it is respectfully requested that this rejection of claim 7 be withdrawn and claim 7 be allowed.

CONCLUSION

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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Date: 1/7/05

By: _____

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